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Municipal Council on the 1st of April, and the Council granted likewise a sum of £400 to the Observatory for the same end. Besides, the shipping companies established at Shanghai have promised to subscribe for the same purpose a sum, the amount of which their agents have not been able to fix immediately, but the sum total may, perhaps, be equivalent to £400. But this sum of £1,200 will be very little for an equatorial telescope of convenient size, for instance of an aperture of 20 inches; very little especially for a complete astronomical observatory.

I have made up my mind to address myself to all those to whom the Lord has distributed, together with fortune, the love of science and the desire of utilizing for its advance the fortune they possess. It is to them to whom I make application, begging them to be so kind as to contribute, according to the pecuniary means they may dispose of, to that development of the Zi-ka-wei Observatory. I am aware that to solicit thus of the public a subscription in favor of a private institution, it would be necessary to be able to present simultaneously titles to the benevolence and guarantees that the solicited money will be usefully employed for the proposed end. But the Zi-ka-wei Observatory can present, I believe, both. Its titles to the benevolence it is its past, and its work of which I have spoken about above; titles which, as it has been seen, are far from being denied by the community of Shanghai. The said work constitutes also, I presume, the best guarantee that the asked-for money will be usefully employed. My claim, being founded on these considerations, I dare hope that my request will be received kindly and that numerous benefactors will be willing to help us to succeed in this useful undertaking.

STANISLAS CHEVALIER S. J.

Director of the Observatory.

ZI-KA-WEI, near Shanghai, 8 April, 1895.

SCIENTIFIC LITERATURE.

The Royal Natural History. Edited by RICHARD LYDEKKER. Vol. III., pp 596. Royal 8°. 1894-1895; Frederick Warne & Co., London and New York.

Volume III. of this important work has just reached America. The first half is devoted to Mammals; the second to Birds. The groups of Mammals treated are the Cetaceans, Rodents, Edentates, Marsupials and Monotremes, thus concluding the class. One hundred and thirty-six pages are given to the Rodentia—the most difficult order of all. That this chapter is the best popular account of the group yet written goes without saying, though in numerous details it is sadly behind the present state of knowledge, particularly with reference to American forms.

In describing the molar teeth of rodents the author forgot the *Geomyidae* and *Aplodontia* when he said: 'permanently-growing rootless molars *always* have complex crowns.' But he made a happy comparison, and one easily remembered, respecting the parallelism between the molar teeth of rodents and of the mastodons and elephants, "the molar tooth of a mouse, which has distinct roots and a low crown with simple cusps, being exactly comparable to that of a mastodon; whereas the high crowned laminated and rootless molar of a guinea pig corresponds as closely with that of a modern elephant."

In describing the coloration of the group as a whole he says that no rodent has 'the tail ornamented with alternate light and dark rings,' forgetting the handsome Mexican ring-tailed ground squirrel (*Spermophilus annulatus*) described by Audubon and Bachman half a century ago.

His ideas of the American chipmunks are hopelessly mixed. He says that southern specimens of the common eastern *Tamias striatus* are 'lighter in color than those from the north.' The reverse is the case. In the same paragraph a California species is

mentioned under the name *T. macrotus*—an animal unknown to American mammalogists, and it may be added that no representative of the eastern chipmunk occurs in western America. Then, turning to the western chipmunks, which he regards as varieties of the Siberian *T. asiaticus*, he says: "The Siberian chipmunk ranges in North America from Lake Superior and the neighborhood of the Barren Grounds to New Mexico and Arizona, and extends from the Atlantic to the Pacific seaboard." This is a mistake, as no member of the group in question approaches the eastern States; and if Mr. Lydekker could see a dozen of our American species (without reference to the subspecies) I am sure he would never again think of them as 'varieties' of the Siberian animal.

The ground squirrels of the genus *Spermophilus* (which by the way is antedated by *Anisonyx*, as already pointed out in this journal, SCIENCE, I., 1, Jan. 4, 1895, p. 18), are said to 'have very nearly the same distribution as the chipmunks.' But in America considerably more than half of the numerous species are desert animals, living where chipmunks never go. It is also stated that nearly all the American species have long tails, whereas more than half of them have short tails.

Our 'prairie dogs' (*Cynomys*) are called 'prairie marmots,' a much better name, but one it would be exceeding difficult to bring into general use. Only three species are recognized (instead of four), the two of the Rocky Mountain plateau (*gunnisoni* and *leucurus*) being confounded under a name belonging to neither, namely, *C. columbianus*. This name, as shown several years ago, belongs to a ground squirrel or suslik inhabiting northern Idaho and parts of Canada.* The distribution given for this imaginary animal (made up of two genera and three species) is equally remarkable, for it is said to range from the 'Columbia through Colo-

rado and Arizona to the Sierra Nevada.' No species of the genus *Cynomys* occurs anywhere in the Columbia region, or in the Great Basin; and no species comes nearer than about 400 miles of the Sierra Nevada. The account of the habits quoted from Lewis and Clark relates exclusively to the northern suslik (*Anisonyx columbianus*).

In the case of the true marmots (*Arctomys*), as in the prairie marmots, only 3 species instead of 4 are recognized—the Rocky Mountain and Sierra-Cascade species being confounded under the name *flaviventer*. The name given for the Arctic-Alpine hoary marmot, *pruinus*, is antedated by *caligatus*.

The jumping mouse (*Zapus*) is said to range from Great Slave Lake and Hudson's Bay to Arizona and Mexico. It has been found in the mountains of Colorado, but I am not aware of a record for Arizona or Mexico.

The American white-footed mice, of which there are several genera, are all lumped with the European Hamsters in the genus *Cricetus*.

Our wood rats (*Neotoma*), of which about 25 species are known, are spoken of as 'a small genus!' The lemmings, singularly enough, are interposed between the voles (*Microtus*) and muskrat (*Fiber*). Had Mr. Lydekker compared the skull of *Fiber* with that of *Microtus amphibius* it is doubtful if he would have recognized it even as a sub-genus.

In characterizing the family of pocket gophers (*Geomyidæ*) the same mistake made in *Flower and Lydekker's Introduction to the Study of Mammals* is repeated, namely, the supposed anterior extension of the cheek bone of jugal. Some remarkable things are said concerning the burrows of these animals.

The 'common Kangaroo rat,' "which inhabits the desert regions to the eastward of the Rocky Mountains," is said to be *Dipodomys phillipsi*. This is perpetuating an old

* N. Am. Fauna, No. 5, July, 1891, pp. 39-42.

error. *Dipodomys phillipsi* does not occur in the United States at all, but in southern Mexico, as pointed out long ago by the reviewer; the only members of the group inhabiting the plains east of the Rocky Mountains belong to the allied genus *Perodipus*. We are told that "Probably the only water these creatures drink is that derived from dew collected on the cactuses." The author may be surprised to hear that dew does not form in the American deserts where Kangaroo rats live, and that these animals, like most other desert rodents, do not drink.

Maximilian's pocket mouse (*Perognathus fasciatus*), which, although unmarked, is called 'the banded pocket mouse,' is said to be 'characterized by the hair being coarse and bristly.' On the contrary, the hair is soft and silky; the only species having stiff hairs belong to another subgenus (*Chaetodipus*).

Only one pika (*Lagomys*) is credited to North America, though at least three are recognized by American mammalogists.

In describing the habits of rabbits it is stated that all the members of the family, except the European rabbit and the hispid hare of northern India, 'dwell either in open country among grass and other herbage, or among rocks and bushes,' forgetting that the common varying hare (*Lepus americanus*) lives in the dense coniferous forest that stretches across the American continent from Labrador and northern New England to Alaska.

After the lumping that characterizes so much of the book, particularly with respect to American mammals, it is refreshing to find that the author, following Lilljeborg, recognizes the common hare of Europe as a distinct species (under the name *Lepus europæus* Pallas) from the mountain hare (*Lepus timidus* Linn.) of Scandinavia and the higher elevations of Europe.

It is also pleasing to note that the author gives the weight of his high authority to

the view that the Old World pangolins and aard-varks probably do not properly belong among the Edentates. The name of the great anteater will probably have to be changed from *Myrmecophaga jubata* to *M. tri-dactyla*, the latter being used by Linnæus in the 10th edition of the *Systema Naturæ*, 1758. The chapter on the Edentates is of special importance, as are those on the Cetaceans, Marsupials and Monotremes.

An important and in every way praiseworthy feature of the work is the brief notice of extinct forms given at the end of each chapter. These, coming from a man of Lydekker's rank as a paleontologist, may be taken as authoritative summaries of the present state of knowledge of fossil mammalia.

Curious liberties have been taken, intentionally or otherwise, in the spelling of generic and specific names, as *Rhithrodontomys* for *Reithrodontomys*, *Haplondon* for *Applodontia*, *Speotito* for *Speotyto*, *capyvara* for *capybara*, *hudsonianus* for *hudsonicus*, and so on. By an unfortunate slip some quotations from the well-known naturalist, J. A. Allen, are attributed to the California bird collector, C. A. Allen.

The illustrations, most of which are from Brehm, as explained in the previous review, cannot always be taken as correct likenesses. For instance, the 'common chipmunk,' on page 78, looks like Say's ground squirrel with the tail of a mongoose; and in the picture of prairie dogs, or prairie marmots, on page 82, the two large animals are certainly not *Cynomys*, but *Arctomys*, and the smaller ones might be anything. The muskrat and pika also are very unlike the animals they are intended to represent.

The work as a whole, while designed for a popular audience and bearing marks of hasty preparation, is nevertheless of much value to professional naturalists, particularly the chapters treating of groups that have been personally studied by the author

—as the Cetaceans, Edentates and their allies, and others. While it has been deemed useful, especially in an American review, to point out the most conspicuous errors in the treatment of the American members of the perplexing order Rodentia, it must not be supposed that other parts of the book are equally open to criticism. In reviews it is both proper and desirable to point out erroneous statements, while, from the nature of the case, like detailed comment respecting the good qualities is well nigh impossible. Hence notices of very good books often seem to consist mainly of adverse criticism. I fear this is true in the present instance.

The bird part of the Royal Natural History will be reviewed separately.

C. H. M.

Lehrbuch der Biologie der Pflanzen. FRIEDRICH LUDWIG. Stuttgart, Verlag von Ferdinand Enke. 1895. 8°, pp. vi + 604, with 28 figures in the text.

The Germans are quite persistent in refusing to recognize as biology the mixture of botany and zoölogy, which is rather unfortunately called biology by the English and Americans, and as a general thing they designate by the latter name the relations of plants to their surroundings, a subject that the Madison Congress of American botanists agreed to call ecology. It is, therefore, to this subject that Professor Ludwig's latest book refers, and it includes chapters on the adaptations of land and water plants to their surroundings, adaptations to a parasitic habit of life, the part played by fungi in the nutrition of higher plants, carnivorous plants, commensalism and symbiosis, adaptations of plants to the physical and chemical character of the soil, climbing plants, phenology, the various protective devices met with in plants, the many interesting arrangements concerned with pollination and dissemina-

tion, and the influence of man on the forms of plants, with which is connected a general discussion of heredity and the causes of variation from hereditary types.

Dr. Ludwig is an earnest student of the relations of plants to their surroundings, especially of their adaptations to pollination by insect agency, and his book appears to be not only pleasantly written, but accurate in its statement of fact.

WM. TRELEASE.

A Monograph of the North American species of the genus polygonum: By JOHN KUNKEL SMALL. Memoirs from the Department of Botany of Columbia College, Vol. I. Issued April 23, 1895. 4°. pp. 183, Pl. A. and 84. Price \$6.00.

While it is generally believed that the classification and naming of plants is a less advanced branch of botanical investigation than the study of their morphology, development and physiology, botany would be a very crude science, indeed, without such work, and one of the duties that fall to the possessors of every large herbarium is that of monographing difficult groups—a duty all the more imperative because of the undeniable fact that such work can only be done where good library and herbarium facilities are at hand.

The botanical department of Columbia College, with one of the finest herbaria and systematic libraries in the country, is apparently fully aware of this fact, and at frequent intervals Dr. Britton and his assistants and special students publish revisions that are helpful to all systematic students of the North American Flora. The last of these publications inaugurates a series of Memoirs which promise to reflect much credit on the institution under the auspices of which they are published.

No collection in the world contains more valuable material for a study of the North American Knotweeds than is to be found at